technical points of view, and as regards the latter the information has been brought up to date by including notices of Webster's improvements in the Deville process, Messrs. Cowles Brothers' electrolytic method of producing aluminium alloys, and the Castner process of reducing sodium from caustic soda at a low temperature, which, in conjunction with Webster's processes, seems likely to render the production of cheap aluminium commercially possible.

The author has contributed to the appendix a series of experiments made by himself on the formation and reduction of aluminium sulphide, which are of interest, although the results, in the reduction experiments at any rate, appear to have been mainly negative. Iron, tin, copper, and antimony were employed as reducing agents, but only with the first two metals was any reduction effected. The concluding paragraph, therefore, reads rather oddly:—
"These processes have been covered by patents, but have never been made successful. It appears that if rightly managed they will give good results and produce aluminium alloys cheaply."

Questions on Physics. By Sydney Young, D.Sc., F.C.S., Lecturer on Chemistry, and Tutorial Lecturer on Physics in the University College, Bristol. (London: Rivingtons, 1887.)

ASSUMING that books consisting of a series of questions with their answers collected together at the end supply a legitimate want and do a real service in the cause of scientific education, Dr. Young's "Questions on Physics" is a valuable addition to those already existing. It is as free as it is possible to make such a book from the charge of encouraging "cram," as the questions are many of them not adapted to rule-of-thumb methods of solution. Many of them also are descriptive of some instrument or principle, in which case, of course, answers are not given. The author takes in succession mechanics, acoustics, heat, magnetism, electricity, and optics. After the answers he gives a series of tables which will be found useful. There are no questions on moment of inertia, or on the ballistic galvanometer. One sentence—the last part of question 155—may vex the student : "Calculate the focal length of a concave lens which gives a magnification of three diameters at a distance of three inches."

The book is intended for the intermediate examination in science and preliminary scientific examination of the London University.

Eminent Naturalists. By Thomas Greenwood, F.R.G.S. (London: Simpkin, Marshall, and Co., 1886.)

THIS is a little book (200 small 8vo pages) intended, as the preface says, to furnish "short yet comprehensive sketches of some leading naturalists." The sketches are certainly "short," but can only be said to be "comprehensive" in the sense that this term may be applied to an epitaph. It is difficult to understand what object such very sketchy biographical sketches can be supposed to serve. Moreover, in this case the subjects appear to have been selected at random ; the result being that the portrait gallery, such as it is, presents a somewhat incongruous assemblage—to wit, Linnæus, Lubbock, Thomas Edward, Louis Agassiz, Cuvier, Buffon, Lyell, and Murchison. Whether this curious arrangement is intended to express the writer's idea of the order of merit of these men, or whether, like his choice of naturalists, it is purely haphazard, we are not informed. But surely, if a biographer goes back as far as Linnæus for his material, and carries down his survey to the present generation, even the most popular of popular readers might have expected him to supply a less deficient index of "eminent naturalists."

LETTERS TO THE EDITOR.

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*]

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to insure the appearance even of communications containing interesting and novel facts.*]

The Carnatic Rainfall.

IF I have rightly interpreted General Strachey's courteous criticism of my paper on the Carnatic rainfall, the gist of his objections may be summed up by saying that the method by which I endeavoured to estimate numerically the genuineness of the apparent cyclical variation of that rainfall, as a recurrent phenomenon, is logically invalid. This, I must frankly admit, is really the case ; my error has been somewhat of the nature of a *petitio principii*, and is indefensible. I have reasoned upon a series of values directly obtained from the observations, as if they had been obtained deductively from some independent source, and had been found, on trial, to agree, within certain allowable limits, with the results of the observations. This procedure, as General Strachey has shown, is manifestly illogical ; and the inferred "high probability that the apparent undecennial fluctuation of the Carnatic rainfall is no chance phenomenon," in so far as this conclusion depends on the above erroneous reasoning, necessarily falls to the ground. But only in so far. The validity of the data afforded by the registers remains, of course, unaffected ; and these data, as they stand, seem to me to furnish evidence of so pronounced a character that it is at least improbable that the apparent fluctuation is fortuitous. The considerations on which I base this opinion are :—

(1) That each series of eleven years, taken separately, shows a dominant fluctuation of that period, and these fluctuations show much accordance, both in their ranges and in the epochs of their critical phases. Simple inspection of the tabulated annual means is sufficient to convince one that there is no regular fluctuation of anything like the same magnitude, differing much from the eleven-year period.

(2) The range of the fluctuation as educed by the harmonic formula (restricted to two periodical terms), is four times as great as the mean deviation of the recorded amounts from the corresponding computed values. And this fact fulfils a condition which, in a less rigorous form, General Strachey suggested, I believe,[1] as a test in his discussion of the Madras rainfall registers, communicated to the Royal Society in May 1877, and the failure of which he rightly assigned as a reason for doubting the reality of the supposed cyclical fluctuation of the Madras rainfall.

That the second of these considerations is valid has been established in my former communication. The computed range of the fluctuation was shown to be 14 inches, and the mean annual deviation of the observed from the computed values ± 3·5 inches. To render the first more obvious, I have computed the harmonic constants, separately, from each of the two undecennial series, and therefrom the annual values in each case. The constants are :—

1st Cycle.		2nd Cycle.	
$u' = 7.23$	$u'' = 0.66$	$u' = 4.22$	$u'' = 5.44$
$U' = 190° 16'$	$U'' = 322° 10'$	$U' = 233° 59'$	$U'' = 240° 14'$

and the computed annual values—

	1st Cycle.	Inches.			2nd Cycle.	Inches.
1864	... ...	− 1·70	1875	... ...	− 8·14
1865	... ...	− 4·62	1876	... ...	− 8·63
1866	... ...	− 6·35	1877	... ...	− 2·61
1867	... ...	− 6·62	1878	... ...	+ 3·46
1868	... ...	− 4·99	1879	... ...	+ 3·69
1869	... ...	− 1·39	1880	... ...	+ 0·07
1870	... ...	+ 3·18	1881	... ...	− 1·46
1871	... ...	+ 6·79	1882	... ...	+ 2·11
1872	... ...	+ 7·23	1883	... ...	+ 6·71
1873	... ...	+ 5·81	1884	... ...	+ 5·97
1874	... ...	+ 2·12	1885	... ...	− 1·04

[1] I quote from memory, not having the Proc. Roy. Soc. at hand.